



(11) Publication number : **0 357 091 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication of patent specification :
07.04.93 Bulletin 93/14

(51) Int. Cl.⁵ : **A61M 27/00**

(21) Application number : **89118552.2**

(22) Date of filing : **30.08.85**

(54) **Drainage tube for inserting in wounds and wound cavities.**

(30) Priority : **06.09.84 DE 3432825**
22.02.85 DE 3506288

(60) Publication number of the earlier application in
accordance with Art. 76 EPC : **0 194 274**

(43) Date of publication of application :
07.03.90 Bulletin 90/10

(73) Proprietor : **Sterimed Gesellschaft für
medizinischen Bedarf mbH**
Fasanerieweg 13-17 Postfach 215
W-6600 Saarbrücken 3 (DE)

(45) Publication of the grant of the patent :
07.04.93 Bulletin 93/14

(72) Inventor : **Reinmüller, Johannes**
Gustav-Freitag-Strasse 27
W-6200 Wiesbaden (DE)

(84) Designated Contracting States :
AT BE CH DE FR GB IT LI LU NL SE

(56) References cited :
DE-U- 8 514 676
FR-A- 358 933
US-A- 3 406 691

(74) Representative : **RUPP, Herbert et al**
Byk Gulden Lomberg Chemische Fabrik
GmbH, Byk-Gulden-Strasse 2, Postfach 6500
W-7750 Konstanz (DE)

EP 0 357 091 B1

Note : Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid (Art. 99(1) European patent convention).

Description

Technical Field of the Invention

The present invention relates to a drainage tube.

In known improved embodiments of drainage tubes, such as a Redon tube, the end portion, i.e. the part of the tube adjacent to the wound, is provided with perforations which become larger and larger towards the end of the tube in order to improve the discharge of secretions; in another embodiment the drainage tube is provided with a spirally progressing groove. However, these drainage tubes have the disadvantage that they can only be pulled out of the wound by overcoming some resistance, particularly if suction is used, which will be painful for the patient. Moreover, the sharp edged perforations or grooves may cause some tearing of tissue or coagulated blood when pulled out, thus causing fresh bleeding.

Such a drainage device is known from FR-A-358 933.

These disadvantages can be avoided with the embodiment of the drainage tube according to the invention in which the section of tube located in the body ends in a plurality of filaments. These drainage tubes can be removed from the wound without any difficulty, with no pain, and no fresh bleeding.

The term "wound" for the purpose of this invention relates to wounds produced by trauma and/or surgical intervention.

The term "wound cavities" for the purposes of this invention relates not only to artificially produced body cavities i.e. those produced by trauma or operation, but also to natural body cavities or hollow organs, e.g. the thoracic cavity, abdominal cavity or the bladder, which may become wound cavities as the result of being opened up in an operation.

The drainage tube according to the invention is characterized in that its end located in the body, i.e. at the wound, is split into several filaments, i.e. terminates in a plurality of filaments (cauda drainage).

The tubular drainage device according to the invention is constructed so that the end of the tube located in the body, i.e. against the wound, is split into several filaments ("frayed" rather like a horses tail or cauda drainage device) between which the liquid to be discharged can trickle in. The filaments may be formed as strips (e.g. by cutting into the end of the tube) or as fibres and be arranged side by side in a flat arrangement or in a bundle. The number of filaments is not critical; it is generally from 4 to 20, particularly from 8 to 12. The length of the filaments depends particularly on the envisaged use (e.g. the size of the wound cavity); it is generally between 5 and 20 cm.

The drainage tubes may consist of a physiologically compatible material conventionally used for such purposes, e.g. made of rubber or more prefer-

ably, plastics. The plastic material may be any physiologically acceptable plastics material conventionally used for these purposes (cf. *Angewandte Chemie* 82, (1970) 367-379; 861 (1974) 145-150). The diameter and length of the drainage tubes depend on the intended purpose; the diameter is generally of the order of 0.5 cm. Preferably, the so-called Redon drainage tube is used as the drainage tube, whilst a vacuum suction drainage tube is preferably used for festering wounds.

The drainage tube consists of a fairly rigid PVC tube about 0.5 cm in diameter and up to 1 m long, to which reduced pressure is applied.

Fig. 1 shows, by way of example, a drainage tube according to the invention without restricting the invention thereto. A drainage tube (1) has filaments (2) at its end which is inserted into the wound.

Claims

1. Drainage tube for draining wound secretions from wounds and wound cavities, characterized in that the end located in the body is split into several filaments (2).
2. Drainage tube according to claim 1, characterized in that the tube is a Redon drainage tube.
3. Drainage tube according to one of claims 1 and 2, characterized in that it consists of a tube about 0.5 cm in diameter and up to 1 m long.
4. Drainage tube according to one of claims 1, 2 and 3, characterized in that the number of filaments (2) is from 4 to 20.
5. Drainage tube according to one of claims 1, 2, 3 and 4, characterized in that the length of the filaments (2) is between 5 and 20 cm.

Patentansprüche

1. Drainrohr zur Drainage von Wundsekret aus Wunden und Wundhohlräumen, dadurch gekennzeichnet, daß das im Körper gelegene Ende in mehrere Filamente (2) aufgetrennt ist.
2. Drainrohr nach Anspruch 1, dadurch gekennzeichnet, daß das Rohr ein Redon-Drainrohr ist.
3. Drainrohr nach einem der Ansprüche 1 und 2, dadurch gekennzeichnet, daß es aus einem Rohr mit einem Durchmesser von etwa 0,5 cm und einer Länge von bis zu 1 m besteht.
4. Drainrohr nach einem der Ansprüche 1, 2 und 3,

dadurch gekennzeichnet, daß die Anzahl der Filamente (2) 4 bis 20 ist.

5. Drainrohr nach einem der Ansprüche 1, 2, 3 und 4, dadurch gekennzeichnet, daß die Länge der Filamente (2) zwischen 5 und 20 cm ist. 5

Revendications

- 10
1. Drain tubulaire destiné à drainer les sécrétions de plaies et de cavités de plaies, caractérisé en ce que l'extrémité située dans l'organisme est fendue en plusieurs filaments (2).
- 15
2. Drain tubulaire selon la revendication 1, caractérisé en ce que le tube est un drain de Redon.
- 20
3. Drain tubulaire selon l'une des revendications 1 ou 2, caractérisé en ce qu'il est constitué par un tube d'environ 0,5 cm de diamètre, ayant jusqu'à 1 m de long.
- 25
4. Drain tubulaire selon l'une quelconque des revendications 1, 2 ou 3, caractérisé en ce que le nombre de filaments (2) est compris entre 4 et 20.
- 30
5. Drain tubulaire selon l'une quelconque des revendications 1, 2, 3 ou 4, caractérisé en ce que la longueur des filaments (2) est comprise entre 5 et 20 cm.

35

40

45

50

55

FIG.1.

